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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/719,567
Filing Date: November 21, 2003
Appellant(s): HART, PAUL R.

David Mossman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 13, 2007 appealing from the Office action mailed May 16, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the Patents relied upon as evidence in the rejection of claims under appeal:

Patent 5,852,592	Bellos et al	12-1998
Patent 5,045,212	Augustin et al	9-1991
Patent 4,835,234	Valint et al	5-1989

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4,6,7 and 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bellos et al patent 5,853,592 in view of Augustin et al patent 5,045,212 ***and in view of Valint et al patent 4,835,234.***

Bellos discloses treating aqueous, i.e. "water-like fluid phase" streams from oil well production fluids from which oil has been primarily initially separated (column 1, lines 42-47 and column 3, lines 20-33, especially lines 24-26).

Bellos et al disclose a composition, for separating water-soluble organics and water (Abstract, column 4, lines 41-43) essentially consisting of a hydrophilic, hydroxyl-monocarboxylic acid, such as hydroxyacetic acid or AHA (column 6, lines 25-32), [inherently having the relatively high pKa of instant claims 2, 11 and 16, (see also column 6, lines 12-24, etc. of the reference) and having the chemical formulation of instant claims 3,12 and 17], such organic acid optionally constituting substantially all or up to about 99% of the active ingredient, relative to inorganic acid and minor amounts of other ingredient (column 6, lines 52-61 and column 6, line 66-column 7, line 12).

Bellos et al also disclose that inorganic acid may be added (to the oil and water mixture being separated) simultaneously but separately from added organic acid or otherwise after the addition of organic acid (column 5, lines 54-59), thus in this instance, the AHA organic acid does not contain any inorganic acid.

Bellos also disclose that the composition may comprise a "minor amount" of one or more other ingredient that may be a demulsifier/flocculant/wetting agent (column 6, line 66-column 7, line 9 and column 7, lines 17-21). Regarding importance of added demulsifier(s), column 7, lines 16-20 indicate that "special" selected demulsifier(s) or flocculant(s) may be required, especially where significant shear is created by stirrers/agitators which are utilized; also see column 3, lines 46-50 and column 4, lines 47-50 that urge use of such stirrers and agitators to separate the water-soluble organics from the aqueous phase, the stirrers contacting the aqueous phase with a stream of oil that functions as a solvent for the organics.

The demulsifier may either be added separately or in combination with the feed or with the organic or inorganic acid (column 7, lines 17-21).

Each of the amounts of each of one or more added minor ingredients may constitute less than 1% by weight of the composition (column 7, lines 8-9), hence optionally giving a ratio of AHA to demulsifier of over 50:1. The composition may or may not be in the form of an aqueous solution before being mixed with oil/water mixture being treated (column 5, lines 42-60 and Figure 1).

It is also noted that Bellos may treat water containing residual amounts of oil phase, water soluble organics in stages or in a series of extraction tanks (column 8, lines 33-35).

Again, with regard to criticality of presence/absence of inorganic acid in the composition, see column 5, lines 54-59 of Bellos that states that inorganic acid may be added to the fluid being treated separately from and after addition of the AHA organic acid.

The instant claims all differ in requiring the demulsifier to constitute an anionic polymer. However, Augustin et al teach to separate oil/water emulsions by anionic demulsifiers (column 2, lines 14-21). ***Specifically, in common with Bellos, Augustin teaches, with regard to crude oil production streams, to firstly add a cationic demulsifier followed by inorganic demulsifier, to separate out much of the oil in a clarified oil phase and then to further purify an aqueous phase stream from which the oil phase has been initially separated, by sequentially adding, in stages, an amount of inorganic demulsifier, followed by an amount of anionic polymeric demulsifier, to the resulting aqueous phase to further clarify such aqueous phase (column 1, lines 45-61, column 2, lines 14-21 and 45-68 and the Table bridging columns 3 and 4 indicating amounts of inorganic demulsifier and anionic polymeric demulsifier added to the aqueous phase).***

Valint et al also teach separation of oil-in-water emulsions such as results from crude oil production or metal-working (column 1, lines 30-55) and teach to sequentially add a cationic polymers or surfactants to break up most of the oil, followed by addition of anionic polymeric flocculants, and in the absence of intermediate step of addition of inorganic demulsifier as in Augustin (Augustin at column 9, lines 9-59, especially lines 56-59).

Regarding the limitation that the composition is absent a cationic emulsion breaker; each of Augustin, column 2, lines 46-62, and Valint , column 9, lines 56-59 and column 10, lines 15-34 teach that cationic emulsion breaker would already be present as a component of the emulsion treated when anionic demulsifier composition is added, thus not forming a part of the anionic demulsifier composition. Such conclusion is further supported by Bellos at column , lines 40-68, and column 3, lines 20-26 concerning preliminary treatment of the oil well production fluids from which oil had already been primarily separate, and also column 8, lines 34-36 regarding the process being conducted in stages.

It would have been obvious to one of ordinary skill in the art to have employed an anionic polymeric demulsifier, as taught by Augustin et al, and further suggested by Valint, as the demulsifier component of Bellos et al, in combination with the AHA, during at least one of the treatment stages of the Bellos process for treating aqueous streams from which the largest quantity of oil has been preliminarily removed [in review see column 1, lines 25-27 and column 8, lines 33-35 of Bellos]. This would have been an obvious selection of demulsifier for the Bellos process, since use of an anionic polymeric demulsifier is shown to result in separated treated water phase, having an environmentally permissible very low degree of contamination of residual oily contaminants, which is lower than what results from use of the other well known types of demulsifiers, without using anionic polymeric demulsifiers (see column 1,lines 21-50 of Augustin for such explicit motivation).

It would also have been obvious to have added, specifically, an anionic, polymeric demulsifier, to the composition applied by Bellos, since Augustin teaches that this type demulsifier results in an aqueous phase resulting from crude oil production being sufficiently clarified to permit its discharge into an outfall ditch, thus meeting environmental standards (column 1, lines 28-36 and column 2, lines 58-62 of Augustin). It is surmised that the modified Bellos method would be augmented by; in a first of the Bellos stages, adding a small amount of inorganic demulsifier/AHA blend, followed in a later treatment stage, by addition of an anionic polymeric demulsifier/AHA blend, and then finally followed by addition of an inorganic acid (see particularly column 5, lines 54-63 and column 8, lines 33-35 of Bellos et al). There would be no cationic emulsion breaker added, since Bellos is only concerned with treating aqueous streams from which the oil has already been primarily separated, possibly with use of phase separation techniques employing cationic emulsion breaker.

Further, if necessary, regarding questions as to whether Bellos, as modified by Augustin and Valint requires the presence of inorganic acids, cationic emulsion breaker or other ingredients, the present claims employ "consisting essentially of" claim language. "Consisting essentially of" claim language limits a claim to the recited ingredients and any ingredients which do not materially affect the novel and/or basic characteristics of the invention. See MPEP 2111.03. There is nothing of record to suggest that the addition of inorganic acid, cationic emulsion breakers or other types of demulsifiers, or any other ingredient, would affects the novel and/or basic characteristics of the present invention concerning efficient separation of water-soluble organics from water.

For claims 8 through 18, column 6, line 66-column 7, line 3 and column 7, lines 9-12 of Bellos, indicate a relatively high ratio of AHA to minor ingredient of demulsifier.

For claims 15-18, the composition may comprise also water-like fluid phase or water and other solubilized organics, such as organic wetting agents, that are soluble in the added water (Bellos at column 7, lines 3-12). If necessary, the composition is added to a fluid mixture being separated, including water and solubilized organics (column 8, lines 4-34), resulting in a mixture encompassing the water and organics being separated as well as the active organic acid ingredient and demulsifier.

For claims 2-4,6 and 7, the claimed "AKA" values and particular claimed organic acids are disclosed in Bellos at column 6, lines 12-28) while Augustin generally teaches the specific anionic polymers claimed.

Augustin teaches the anionic polymer being copolymers of acrylic or methacrylic acid and acrylamides and esters thereof for claims 4,7,13 and 18 at column 2, lines 14-21, and these having a high degree of polymerization as in claims 5, 6 and 14 (see column 2, lines 17-19 concerning the polymers preferably having a high molecular weight exceeding 0.8 million, thus necessarily having a degree of polymerization well above the claimed 30 figure.

(10) Response to Argument

It is argued that Bellos et al require both a strong organic acid and a strong mineral acid. Appellant's state that Bellos repeatedly emphasizes use of a composition containing a combination of strong organic acid and strong mineral acid, whereas the claim language "consisting essentially of" excludes ingredients that would materially affect the basic and novel properties of the invention" including mineral acids. In the Bellos process, mineral acid may be added to an aqueous solution being treated, separately and simultaneously, or after addition of the organic acid, thus the two types of acids may be in separate, unrelated compositions (column 5, lines 58-59); otherwise, mineral acid may form only a minor portion of organic acid composition of about 1% (column 6, lines 59-60). If needed, regarding the "consisting essentially of" language, again, there is nothing of record to suggest that the addition of inorganic acid, or any other ingredient, would affect the novel and/or basic characteristics of the present invention concerning efficient separation of water-soluble organics from water.

It is argued that Bellos et al mentions optional demulsifiers but does not teach them for typical formulations. Appellant's point to text from Bellos which indicates that presence of demulsifiers is only optional ('may be included') and is not included in the "typical acid formulation", hence relatively unimportant. It is stated that Bellos do not indicate demulsifiers as being particularly desirable or important.

It is submitted that the formulation labeled 'typical' by Bellos at column 7, lines 3-13 only concerns an embodiment that utilizes a pre-mixed formulation employing organic acid and mineral acid together. However, at column 5, lines 54-60, Bellos discusses embodiments where mineral acid and organic acid are formulated as separate compositions that may be fed to the liquid mixture being treated either simultaneously or sequentially. Regarding importance of added demulsifier(s), column 7, lines 16-20 indicate that "special" selected demulsifier(s) or flocculant(s) are utilized (the terms flocculant and demulsifier are somewhat interchangeable in the oil and water emulsion separation arts, see Augustin at column 1, lines 64-66) are utilized, especially where significant shear is created by stirrers/agitators which are utilized that form oil-in-water emulsions; also see column 3, lines 46-50 , column 4, lines 47-50 and column 7, lines 37-40 that urge use of such stirrers and agitators to separate the water-soluble organics from the aqueous phase, the stirrers contacting the aqueous phase with a stream of oil that functions as a solvent for the organics.

It is argued that Bellos et al and Augustin et al do not teach or suggest what demulusifier should be included in Bellos et al combination's. It is stated that Bellos do not mention or suggest any particular type or classification of demulsifier to be utilized, thus is open to unlimited possibilities. It is stated that Augustin teaches three different demulsifiers and give no motivation as to why only an anionic polymeric demulsifier would be employed. It is stated that the shared concern of Bellos and Augustin with treatment of aqueous phases to remove residual organic or acid contaminants after completing initial separation of the bulk of the oily phase is not germane to selection of anionic polymeric demulsifier and that Augustin and Valint each require the presence of other demulsifiers in processes, while employing relatively small quantities of the anionic polymer.

Firstly, it is repeated that Bellos suggests special selection of demulsifiers and/or flocculants (column 7, lines 17-19), while Augustin teaches certain specific anionic polymeric demulsifiers as being "particularly preferred" (column 2, lines 14-21). Secondly, Bellos is directed towards treatment of aqueous phase or stream from which oil has been primarily separated (column 3, lines 24-26, etc), hence eliminates selection of demulsifiers that are normally associated with initial separation of oil from oil water production fluids including cationic demulsifier (Augustin at column 1, lines 55-60). Augustin and Valint teach sequential addition of different demulsifiers, with anionic, polymeric demulsifier employed in a later stage of final treatment of aqueous phase (Augustin at column 1, lines 51-61 with column 2, lines 14-21, etc.); hence fitting in with the concept in Bellos, of treating the aqueous phase/stream in stages. Hence, it is conjectured that Bellos in view of Augustin and Valint would incorporate a non-anionic demulsifier (ex. inorganic demulsifier) with organic acid (AHA) in an earlier stage and an anionic polymeric demulsifier with organic acid in a later stage of treatment.

It is argued that the teachings of Bellos et al and Augustin et al are inconsistent with each other. Appellant's state that the processes and use of compositions of the references are incompatible with each other in view of requirement in Bellos for a largely mineral acid formula and requirement in Augustin for use of di- and multi-valent metal salts. Appellant's conclude that combining of compositions of Augustin and Bellos would result in undesirable results such as unwanted precipitation of impurities. It is stated that use of cationic emulsion breakers in Augustin and cationic flocculant in Valint would similarly lead to undesirable results.

To begin with, the Board is reminded that the outstanding claims are composition claims, not method claims. The rejection of the claims is not advocating amending or modification of process steps of Bellos with process steps of Augustin (and/or of Valint). Neither is combining of different compositions of Bellos with compositions of Augustin and/or Valint advocated. It is submitted that in at least one treatment step or stage of Bellos, the disclosed, un-specified demulsifier combined with the disclosed AHA, can be selected to be an anionic polymeric demulsifier, such as one of the particularly preferred anionic polymer of Augustin (see column 2, lines 14-21). In reviewing the entirety of each of the Augustin, Valint and Bellos references, and in reviewing the combination of references evaluated together, a composition of such combination of AHA and anionic polymeric demulsifier would be employed in one or more of the later treatment stages of Bellos. Looking at the combination of references together, it is appreciated that another composition with another demulsifier, such as an inorganic demulsifier, in combination with organic acid, may be employed in a separate, earlier stage of Bellos, etc.

It is argued that the uniquely simple combination of anionic polymer with AHA is not taught by Bellos et al combined with Augustin et al. and/or Valint et al. Appellant's state that Valint is almost entirely focused on importance of cationic polymers or surfactants, while Augustin teaches anionic polymers only used in combination with inorganic and cationic demulsifiers. It is further stated that neither secondary teaching reference mentions demulsifiers being used in combination with any kind of organic or inorganic acid.

It is firstly emphasized that Bellos explicitly disclose the first of the simple two-component composition claims (AHA) and suggest including a material from the family of compounds (demulsifiers) that include the second of the two claimed materials. Augustin and Valint, each concern 'processes', having similar objectives to those of Bellos (removal of residual amounts of oily and organic liquids. Augustin and Valint admittedly utilize relatively smaller amounts of anionic demulsifer, however small amounts of such material employed do not equate to such material being of small importance. Augustin and Valint emphasize that is the combination of different demulsifying compositions employed sequentially that results in more thorough cleaning of aqueous phase. Bellos is solely relied upon for the combination of AHA and demulsifier, Augustin and Valint are only needed to specify type of demulsifying agent employed.

It is argued that anionic polymers per se. do not remove oil demulsified in water. It is stated that anionic polymers per se do not remove oil demulsified in water and require that emulsions being treated be previously treated with cationic substances so as to be cationized in order for the anionic polymers to work.

It is submitted that the rejection of the claims does not preclude different types or categories of demulsifiers being employed in series or stages; cationizing of emulsions followed by treatment with anionic polymers are process steps and neither support or refute the obviousness of the claimed composition , or if necessary, it's use during at least one step/stage of a process.

It is argued that there is no motivation for combining the references as supposed by the examiner. Appellant's urge that there is nothing in the applied prior art to make the limited "consisting essentially of" 2-component combination obvious. It is stated that the references 'barely mention' anionic polymer and Augustin teaches use of only a relatively small amount of such polymer respective to other components.

It is firstly emphasized that Bellos explicitly disclose the first of the simple two-component composition claims (AHA) and suggest including a material from the family of compounds (demulsifiers) that include the second of the two claimed materials. Augustin and Valint, each concern 'processes', having similar objectives to those of Bellos (removal of residual amounts of oily and organic liquids) in which motivation to select the particular claimed type of demulsifier material in the composition, namely more complete removal of oily or organic material contained in oil-in-water composition is suggested. Neither relative amounts of a material employed nor the extent of disclosure in a reference relied upon negate the explicit teaching of the presence of a claimed material for a composition.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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